CLAIMS

That which is claimed is:

1. A method of controlling thickness uniformity of an organosilicate film deposited on a large substrate, said method comprising the steps of:

providing a large substrate in a processing chamber;

controlling a temperature of at least two distinct locations on the large substrate to include a perimeter area of a surface of the large substrate and an area of the surface inside of the perimeter area; and

maintaining the temperature of the perimeter area of surface of the large substrate within a range between about 10°C less than the temperature of the area of the surface inside of the perimeter area to about 20°C higher than the temperature of the area of the surface inside of the perimeter area; and

depositing the organosilicate film, wherein the organosilicate film deposited has a film uniformity less than or equal to about 10%.

2. The method of claim 1, wherein the temperature of the perimeter area of the surface is controlled by a first heater element in a susceptor and underlying the perimeter area of the substrate, and the temperature of the area of the surface inside of the perimeter area is controlled by a second heater element in the susceptor and underlying the area inside of the perimeter area, said controlling comprising maintaining the temperature of the perimeter area within a range of about 380°C to about 410°C, while maintaining the area inside of the perimeter area at about 390°C.

3. The method of claim 2, wherein the organosilicate film is produced from a precursor comprising TEOS, and said controlling comprises maintaining the temperature of the perimeter area at about 390°C while maintaining the areas inside of the perimeter at about 390°C.

4. The method of claim 2, wherein the organosilicate film is produced from a precursor comprising TEOS, and said controlling comprises maintaining the temperature of the perimeter area at greater than 390°C to about 400°C while maintaining the area inside of the perimeter at about 390°C.

5. The method of claim 2, wherein the organosilicate film is produced from a precursor comprising TEOS, and said controlling comprises maintaining the temperature of the perimeter area at greater than 400°C to about 410°C while maintaining the area inside of the perimeter at about 390°C.

6. The method of claim 2, wherein the organosilicate film is produced from a precursor comprising TEOS, and said controlling comprises maintaining the temperature of the perimeter area at about 410°C while maintaining the area inside of the perimeter at about 390°C.

7. The method of claim 1, wherein the temperature of the perimeter area of the surface is controlled by a first heater element in a susceptor and underlying the perimeter area of the substrate, and the temperature of the area of the surface inside of the perimeter area is controlled by a second heater element in the susceptor and underlying the area inside of the perimeter area, said controlling comprising maintaining the temperature of the perimeter area within a range of about 350°C to about 460°C, while maintaining the area inside of the perimeter area within a range of about 340°C to about 450°C.

8. The method of claim 7, wherein said depositing comprises depositing a thin organosilicate film from a TEOS precursor on the substrate.

9. The method of claim 1, wherein said depositing comprises depositing a thin organosilicate film from a TEOS precursor on the substrate.

10. The method of claim 1, wherein said depositing comprises a chemical vapor deposition.

11. The method of claim 1, wherein said depositing further comprises inputting TEOS, He, and oxygen into a PECVD chamber; and applying RF energy to generate a plasma.

12. The method of claim 11, wherein said TEOS is inputted at about 300 sccm, said He is inputted at about 100 sccm, said oxygen is inputted at about 5000 sccm and said RF energy is inputted at a power density of about .3 to .7 W/cm^2 and a frequency of about 13.56 Mhz.

13. The method of claim 12, wherein said depositing is conducted for about one minute.

14. A substantially uniform thin organosilicate film having been deposited on a large substrate while maintaining a peripheral area of a surface of said substrate within a range between about 10°C less than a temperature of the area of the surface inside of the perimeter area to about 20°C higher than the temperature of the area of the surface inside of the perimeter area.

15. The substantially uniform thin organosilicate film of claim 14, said peripheral area of the surface of said substrate having been maintained at a temperature of about 390°C to about 410°C, while maintaining the temperature of said area of the surface inside of said peripheral area at about 390°C.

16. The substantially uniform thin organosilicate film of claim 14, wherein said thin organosilicate film is formed from a precursor comprising TEOS.

17. The substantially uniform thin organosilicate film of claim 16, said thin organosilicate film having been deposited by chemical vapor deposition.

18. The substantially uniform thin organosilicate film of claim 16, said thin organosilicate film having been deposited by plasma enhanced chemical vapor deposition.

19. The substantially uniform thin organosilicate film of claim 14, said film having a substantially uniform thickness of about 1000 Å.

20. A substantially uniform thin organosilicate film formed from a precursor comprising TEOS and having been deposited on a large substrate while maintaining a

peripheral area of a surface of said large substrate within a range between about 10°C less than a temperature of the area of the surface inside of the perimeter area to about 20°C higher than the temperature of the area of the surface inside of the perimeter area, said substantially uniform thin organosilicate film having a film uniformity less than or equal to about 10%.

22. A flat panel stack comprising:

a large substrate; and

an organosilicate film having been deposited over said large substrate by plasma enhanced chemical vapor deposition and having a film uniformity of less than or equal to about 10%.

23. The flat panel stack of claim 22, said organosilicate film having been formed using a precursor comprising TEOS.

24. The flat panel stack of claim 22, wherein said organosilicate film has a substantially uniform thickness of at least about 1000 Å.

25. The flat panel stack of claim 22, said organosilicate film having been deposited while maintaining a peripheral area of a surface of said large substrate within a range between about 10°C less than a temperature of the area of the surface inside of the perimeter area to about 20°C higher than the temperature of the area of the surface inside of the perimeter area.